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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT PAPER NUMBER

1753

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/909,638

Applicant(s)

RAMSEY, J. MICHAEL

Examiner

Jeffrey T. Barton

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Seiler et al.

Seiler et al disclose a method of controlling fluid flow in an interconnected channel structure having three ports, comprising: actively controlling the electric potential at the ports to create differences in potential sufficient to cause fluid to move through the channel structure in a controlled manner. (Figure 1; Page 1484, Repetitive injections section, 1st paragraph)

3. Claims 2-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Pentoney et al.

Regarding claim 2, Pentoney et al disclose a method of controlling movement in a microscale channel, comprising: flowing a first fluid material through a first microchannel portion (Electroosmotic flow, see Results and Discussion section; Microchannel dimensions for all capillaries disclosed in Figure 2); and constricting the flow of this fluid by concomitantly introducing additional fluid into the first channel portion from two other microchannel portions that connect to opposite sides of the first

microchannel (Results and discussion section, 1st and 3rd paragraphs; Raising the reagent reservoirs above the buffer reservoirs will inherently cause flow from both side channels into the main channel which guides the electroosmotic flow)

Regarding claim 3, Pentoney et al disclose all channel portions meeting at a cross intersection. (Figures 2, 3) Pinching of the first fluid would result, given the flow pattern discussed above.

Regarding claim 4, Pentoney et al disclose electroosmotic flow of the first fluid. (Results and Discussion section, 2nd paragraph)

4. Claims 1-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Jacobson et al.

Regarding claim 1, Jacobson et al disclose a method of controlling fluid flow in an interconnected channel structure having four ports, comprising: actively controlling the electric potential at the ports to create differences in potential sufficient to cause fluid to move through the channel structure in a controlled manner. (Experimental, Results and Discussion sections)

Regarding claim 2, Jacobson et al disclose a method of controlling movement in a microscale channel, comprising: flowing a first fluid material through a first microchannel portion; and constricting the flow of this fluid by concomitantly introducing additional fluid into the first channel portion from two other microchannel portions that connect to opposite sides of the first microchannel (Figure 3b, Results and Discussion section, 1st paragraph)

Art Unit: 1753

Regarding claim 3, Jacobson et al disclose the channel portions meeting at a cross intersection, and the first fluid being pinched at the intersection. (Figure 3b, Results and Discussion section, 1st paragraph)

Regarding claim 4, Jacobson et al disclose electrokinetic flow of the first fluid. (Results and Discussion section, 1st paragraph)

Regarding claim 5, Jacobson et al disclose imaging the material following the constricting step. (Figure 3b is such an image)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moring in view of Pentoney et al.

Regarding claim 2, Moring discloses a method of controlling fluid flow in microscale channels, comprising: flowing a first fluid through a first microchannel portion (Figure 6, capillaries 513 and 514; Column 5, lines 5-8); and constricting the flow by concomitantly flowing additional fluid into the first channel portion from one of two additional channel portions connected to opposite sides of the first channel portion. (Figures 6 and 8; Column 6, lines 55-68)

In addition, Moring discloses the additional capillary being present for flexibility of operation (Column 7, lines 1-3), and the possibility of plural reagents being introduced. (Column 3, lines 39-43)

Regarding claim 3, Moring discloses the channels being connected at a cross intersection (Figure 6). Pinching of the first fluid at the confluence of flows would inevitably occur.

Regarding claim 4, Moring discloses the first fluid being flowed electrokinetically. (Column 3, lines 60-68; Column 5, lines 5-8)

Regarding claim 5, Moring discloses imaging the first fluid material after the constricting step. (Column 4, lines 27-39; Column 9, lines 53-55)

Moring does not explicitly disclose flow into the first channel section through the second side channel concomitant with the flow through the first side channel.

Pentoney et al disclose a capillary electrophoresis method including simultaneous confluent flow through two side channels into a flow within the central channel. (Results and Discussion Section, 1st - 3rd paragraphs)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Moring by introducing additional reagents to the reactor by providing flow through both side channels of the cross intersection, as taught by Pentoney et al, because Moring discloses such flexibility of operation and the possible requirement of additional reagents.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Art Unit: 1753

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claim 1 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 15 of U.S. Patent No. 6,001,229 in view of Seiler et al.

Claim 15 of U.S. Patent No. 6,001,229 claims a method of effecting material transport (i.e. controlling fluid flow) in an interconnected channel structure having at least five ports, otherwise according to the limitations of instant claim 1.

Seiler et al disclose a method of controlling fluid flow in a similar device that has only three ports.

It would have been obvious to one having ordinary skill in the art to modify the method claimed by claim 15 of U.S. Patent No. 6,001,229 to control material transport in a three-port device, such as that of Seiler et al, because such microfluidic devices are known and operate on the same principles as the claimed devices. In addition, the language of the instant claim (e.g. 'at least three ports') encompasses the embodiment claimed by claim 15 of U.S. Patent No. 6,001,229.

10. Claims 2-4 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 14 of U.S. Patent No. 6,001,229. Although the conflicting claims are not identical, they are not patentably distinct from

each other because the recitation of structure in the preamble of claim 14 of U.S. Patent No. 6,001,229 is equivalent to that of instant claim 2, and all other limitations of instant claims 2-4 are also present. Additionally, all limitations not in common between an instant claim and claim 14 of U.S. Patent No. 6,001,229 (e.g. side channels not directly opposed, non-electrokinetic flow) are obvious modifications to the method, and the open language of the instant claims (i.e. 'comprising') allows the presence of features that are not explicitly stated.

11. Claim 5 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 14 of U.S. Patent No. 6,011,229 in view of Jacobson et al. The reasoning given above in paragraph 10 applies to most limitations of claim 5. Additionally, Jacobson discloses imaging of the pinched sample after establishment of the respective flows. (Figure 3b) This is an obvious modification of the method of claim 14 of U.S. Patent No. 6,001,229, because it would allow verification of the effectiveness of the injection procedure in limiting diffusion.

12. Claims 1-4 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6 of U.S. Patent No. 6,342,142. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons.

Regarding instant claim 1, claim 6 of U.S. Patent No. 6,342,142 discloses a method according to these limitations, except that no ports are explicitly claimed, and

Art Unit: 1753

electrical potential is not explicitly controlled. However, these are obvious modifications as they are conventional features of microfluidic methods.

Regarding instant claims 2-4, claim 6 of U.S. Patent No. 6,342,142 discloses the same pinching method of injection, without explicitly claiming electrokinetic fluid flow. However this is an obvious modification, because it is a conventional feature of microfluidic methods.

13. Claim 5 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 6 of U.S. Patent No. 6,342,142 in view of Jacobson. The reasoning for this rejection parallels that given above in paragraphs 11 and 12.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 1753

published applications may be obtained from either Private PAIR or Public PAIR.

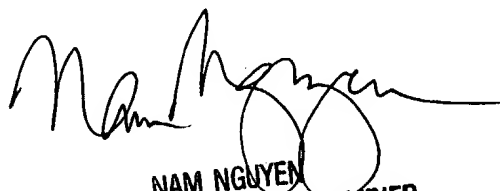
Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at (866) 217-9197 (toll-free).

JTB

October 22, 2004



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